

REMARKS

Applicants appreciate the thorough review of the present application as reflected in the Office Action of March 28, 2005, as well as the indication that Claims 9, 12-13, 15-16, 24, 27 and 37 are directed to allowable subject matter. Applicants have amended Claims 1 and 22. Claims 1-6, 10, 14, 17-23, 25-26 and 28-35 stand rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,118,805 to Bergstrom et al. ("Bergstrom"). Claims 7-8, 11 and 36 stand rejected under 35 U.S.C. § 103 as obvious in light of Bergstrom and one of two secondary references. Applicants have carefully reviewed the Bergstrom reference and identified a number of significant differences between the methods and systems discussed therein and the methods and systems recited in the pending claims. These differences are discussed in detail below. Based on these differences, Applicants respectfully submit that the cited references – either alone or in combination – fail to disclose or suggest the inventions claimed in the present application and that, as such, the present rejections should be withdrawn and the application passed to issuance.

I. The Rejections of Claims 1-8, 10-11, 14 and 31-32 Should be Withdrawn

Claims 1-6, 10, 14 and 31-32 stand rejected as anticipated by Bergstrom. Claims 7 and 8 stand rejected as obvious over Bergstrom in view of U.S. Patent No. 5,905,543 to Wiedemman et al. ("Wiedemman") and Claim 11 stands rejected as obvious over Bergstrom in view of U.S. Patent No. 6,442,384 to Shah et al. ("Shah"). Claim 1 recites:

1. A method of demodulating a received signal, the method comprising:
 - providing an interference map containing information regarding a plurality of candidate interference sources;
 - identifying any of the candidate interference sources that comprise a dominant interference source based on the received signal and the information regarding the plurality of candidate interference sources;
 - demodulating the received signal to recover wanted information while compensating for interference with the aid of the information stored in the interference map.

Applicants respectfully submit that Bergstrom fails to disclose or suggest either of the last two clauses of Claim 1. As such, the rejection of Claim 1, and Claims 2-8, 10-11 and 14, each of which depend from Claim 1, should be withdrawn.

In particular, the next to last clause of Claim 1 recites, among other things, "identifying any of the candidate interference sources that comprise a **dominant** interference source." This identification is not disclosed or suggested in Bergstrom. Instead, the system of Bergstrom is focused on identifying and classifying interfering signals by **interference type**, so that an appropriate type of interference suppression technique may be used on each of the interference signals. (*See, e.g.*, Bergstrom at Col. 2, lines 44-48; Col. 3, lines 49-57; Col. 6, lines 2-19; Col. 8, lines 9-35). The Official Action cites to (a) element 18 of Fig. 2, (b) element 104 of Fig. 4, (c) Col. 2, lines 35-50, (d) Col. 3, lines 39-61, (e) Col. 5, line 62 through Col. 6, line 19, (f) Col. 7, line 54 through Col. 8, line 35, (g) Col. 9, lines 47-67 and (h) Col. 18, lines 1-22 of Bergstrom as teaching the identification of one or more dominant interference sources. However, as shown below, none of these passages include any such teaching.

For instance, element 18 of Fig. 2 of Bergstrom is a receiver. Nothing within the receiver box of Fig. 2 or the description of the receiver in the text involves identifying one or more interference sources as dominant interference sources. Likewise, element 102 of Fig. 4 is part of a joint time-frequency plane that shows three interfering signals as a function of time. Nowhere in Fig. 4 or the discussion thereof is there any suggestion that one or more of these interfering signals should be identified as a dominant interference source. Bergstrom likewise does not provide any indication as to how such a determination might be made, as Bergstrom was not interested in identifying such dominant interference source(s). Col. 2, lines 35-50, and Col. 3, lines 39-61 of Bergstrom each discuss reducing the effects of unwanted interference by classifying interference sources by type, so that an appropriate interference suppression technique can be applied to each interference source. Once again, there is no disclosure or suggestion of identifying dominant interference source(s). Col. 5, line 62 through Col. 6, line 19 of Bergstrom discusses how a JSOI memory 46 is provided that stores a library of feature plane representations corresponding to different jamming and interference types. The JSOI memory 46

may be used in classifying interference components in the received signal. This interference classification is used to determine the appropriate interference suppression that is used. Nowhere does this passage from Bergstrom disclose or suggest identifying which interference source(s) are dominant. Col. 7, line 54 through Col. 8, line 35 of Bergstrom discusses a "targeted interference suppression unit 78." This unit 78 includes a library of software modules that each work best with removing a particular type or class of interference/jamming. Again, this passage from Bergstrom does not disclose or suggest identifying which interference source(s) are dominant. Col. 9, lines 47-67 of Bergstrom discusses a "classifier 92" that is used to classify the interference and jamming components in the received signal. It does not discuss identifying which interference source(s) are dominant. Finally, Col. 18, lines 1-22 discusses estimates that may be made of the bit error rate. This passage likewise does not involve identifying which interference source(s) are dominant.

As shown above, none of the cited passages of Bergstrom disclose or suggest identifying one or more interference sources as dominant interference sources as recited in the next to last clause of Claim 1. Accordingly, Applicants respectfully submit that the rejection of Claim 1 under 35 U.S.C. § 102 should be withdrawn.

The last clause of Claim 1 recites "demodulating the received signal to recover wanted information while compensating for interference with the aid of information stored in the interference map." The Official Action cites to Col. 3, lines 39-61 and Col. 6, lines 20-38 of Bergstrom as disclosing demodulating "while compensating for interference with the aid of information stored in the interference map." (Official Action at p. 3). However, the cited passage from Col. 3 of Bergstrom expressly recites that the demodulation and decoding occurs after the interference components have been suppressed, as opposed to while the interference compensation is occurring. (Bergstrom at Col. 3, lines 57-60, stating "[a]fter the interference components have been suppressed, the receive signal is transferred to the demodulation/decoding unit"). Likewise, the cited passage from Col. 6 of Bergstrom also expressly states that "[a]fter the interference jamming signals in the receive signal have been suppressed, the interference suppression processor 42 outputs the restored spread spectrum signal for despreading, demodulation and decoding." (Bergstrom at Col. 6, lines 20-23, emphasis added). Thus, Applicants submit that the

rejection of Claim 1 should also be withdrawn on the separate and independent basis that Bergstrom does not disclose, and in fact teaches away from, "demodulating the received signal to recover wanted information while compensating for interference" as recited in Claim 1.

Applicants submit that Claims 2-8, 10-11 and 14, each of which depend from Claim 1, are patentable for the reasons that Claim 1 is patentable over the cited art. In addition, Applicants respectfully submit that these claims are also patentable over the cited art for at least the additional reasons discussed below.

Claim 3 recites, among other things, "generating a plurality of classification measures associated with a plurality of interference scenarios." Dominant interference sources (if any) may then be identified as the interference sources associated with the interference scenario that the classification measure indicates is the most likely interference scenario. The cited portions of Bergstrom discuss "classifying each of the undesired spectral components [in the received signal] (if any) by interference-type." (*See, e.g.*, Bergstrom at Col. 2, lines 38-40). However, as the above-quote makes clear, the classification of Bergstrom involves classifying each interference source by type (so that appropriate interference suppression techniques may be applied to each interference source), whereas the method of Claim 3 involves generating classification measures with a plurality of interference scenarios, and then determining which of these plurality of interference scenarios is the most likely scenario as a way of identifying the dominant interference sources. Bergstrom simply contains no disclosure of the method of Claim 3.

Claim 4 recites that "each classification measure is based on the difference between the received signal and an expected receive signal for one of the plurality of interference scenarios." The Official Action cites the classifiers 314 and 74 of Bergstrom as teaching this recitation. However, the passages from Bergstrom cited in the Official Action make clear that the classification of Bergstrom is done based on "frequency domain information from FFT unit 70 and the time domain information from the frequency hopping tuner 68" which the classification unit 74 uses "to identify and classify the interference/jamming components in the input receive signal." (Bergstrom at Col. 7, lines 58-63). There is no discussion in Bergstrom of the classification measures being "based on the difference between the received signal

and an expected receive signal for one of the plurality of interference scenarios" and, in fact, Bergstrom expressly states that the classification is based on something else.

Claim 5 recites "jointly demodulating a desired carrier and any identified dominant interference source." The Official Action states that Bergstrom "inherently" discloses such joint demodulation. Applicants respectfully submit that such joint demodulation is not "inherent" in the methods of Bergstrom. In fact, as discussed above with respect to Claim 3, Bergstrom expressly states that the interfering signal is removed (suppressed) before the signal is demodulated. In any event, as is made clear in the specification of the present application, "joint demodulation does not refer to conventionally demodulating a single signal that also includes one or more noise elements. Instead, "joint demodulation" refers to a process "in which co-channel interference may be reduced by hypothesizing an interfering signal as part of an MSLE process to cancel the interfering signal during demodulation of the desired carrier." (Specification at p. 3). There is no discussion in Bergstrom whatsoever of such joint demodulation techniques, and Bergstrom expressly states that the interference suppression is done before demodulation, not during demodulation as is done in a joint demodulation process.

Claim 6 recites, among other things, "estimating updated information regarding any identified dominant interference sources." As noted above, Bergstrom does not disclose or suggest identifying dominant interference sources, and thus clearly does not disclose or suggest estimating updated information regarding such signals.

Thus, for at least each of the above reasons, Applicants respectfully submit that the rejections of Claims 1-8, 10-11 and 14 should be withdrawn.

Claims 31 and 32 stand rejected based on the same rationale as Claims 1 and 2. Thus, for at least the reasons discussed above with respect to Claim 1, the rejections of Claims 31 and 32 should be withdrawn.

II. Claims 17-21 are Patentable Over the Cited Art

Claim 17-21 each stand rejected as anticipated by Bergstrom. Applicants also respectfully submit that Bergstrom does not anticipate any of these claims for the at least reasons discussed below.

With respect to independent Claim 17, the last clause thereof recites "canceling at least part of the signal received from a co-channel interference source during demodulation of the received signal." As discussed above with respect to independent Claim 1, Bergstrom expressly states that the cancellation of the interference source is done before demodulation. (*See, e.g.*, Bergstrom at Col. 3, lines 57-60 and Col. 6, lines 20-23). Bergstrom contains no disclosure of situations where the cancellation of the received signal is done during demodulation. Thus, Applicants respectfully submit that the rejection of Claim 17 should be withdrawn for at least this reason.

The last two clauses of Claim 18 and the last clause of Claim 19 are almost word-for-word identical to the last two clauses of Claim 3 and the last clause of Claim 4, respectively. Thus, for the reasons discussed above with respect to Claims 3 and 4, Applicants respectfully submit that Bergstrom also fails to disclose or suggest the subject matter of Claims 18 and 19.

Thus, for at least each of the above reasons, Applicants respectfully submit that the rejections of Claims 17-21 should be withdrawn.

III. The Rejections of Claims 22, 23 and 25 Should Be Withdrawn

Claims 22, 23 and 25 also stand rejected as anticipated by Bergstrom. Applicants also respectfully traverse each of these rejections.

The first clause of independent Claim 22 following the preamble recites "identifying any dominant co-channel interference component in the received signal." As discussed in detail above with respect to Claim 1, Bergstrom fails to disclose or suggest anything with respect to identifying one or more particular components of the interference as being dominant components. Accordingly, the rejection of Claim 22 should be withdrawn for this reason. Additionally, Bergstrom also fails to disclose "classifying an interference scenario associated with the received signal based on the results of the identifying step." Instead, the cited portions of Bergstrom are directed to identifying the type of each interfering signal; there is no discussion in Bergstrom of classifying an interference scenario based on the identification of which co-channel interference components in the received signal are dominant. This provides a second independent reason for withdrawal of the rejection of Claim 22. Claim 22 further

recites "selecting a demodulation algorithm based on the interference scenario classification." The Official Action cites to Col. 9, line 46 through Col. 10, line 34 of Bergstrom as disclosing this recitation. However, what the cited portion of Bergstrom in fact discusses is how the system of Bergstrom classifies an interference signal by type. Nowhere does Bergstrom disclose or suggest selecting between multiple demodulation algorithms based on an interference scenario classification and, in fact, Bergstrom does not even disclose or suggest using multiple demodulation algorithms under any circumstances. Thus, Bergstrom also fails to teach the third clause of independent Claim 22. Applicants respectfully submit that the rejection of Claim 22, as well as the rejections of Claims 23 and 25 which depend therefrom, should be withdrawn, for at least these reasons.

Additionally, Claim 23 recites, among other things, that "information from the interference map is used in demodulating the received signal." Applicants respectfully submit that the cited portions of Bergstrom do not disclose or suggest using information from an interference map during demodulation. Instead, even to the extent that the JSOI of Bergstrom comprises an interference map, Bergstrom clearly states that the information therein is used to perform interference suppression prior to demodulation. (*See, e.g.*, Bergstrom at Col. 3, lines 57-60 and Col. 6, lines 20-23). This provides a further basis for withdrawal of the rejection of Claim 23.

IV. The Rejections of Claims 26 and 28-30 Should Be Withdrawn

Claim 26 stands rejected based on the same rationale as Claim 22. Thus, for at least the reasons discussed above with respect to Claim 22, the rejections of Claim 26, and Claims 28-30 which depend therefrom, should be withdrawn.

Claim 28 stands rejected based on the same rationale as Claims 5 and 22. Thus, for at least the reasons discussed above with respect to Claims 5 and 22, the rejection of Claim 28 should be withdrawn.

Claim 29 stands rejected based on the same rationale as Claim 23. Thus, for at least the reasons discussed above with respect to Claim 23, the rejection of Claim 29 should be withdrawn.

V. The Rejections of Claims 33-36 Should be Withdrawn

Claims 33-35 stand rejected as anticipated by Bergstrom. Claim 36 stands rejected as obvious over Bergstrom in view of Shah. Applicants also respectfully traverse these rejections.

The next to last clause of independent Claim 33 is almost word-for-word identical to the next to last clause of Claim 1. Thus, for the reasons discussed above with respect to Claim 1, Applicants respectfully submit that Bergstrom does not disclose or suggest this recitation of Claim 33. Similarly, the last clause of Claim 33 recites "demodulating the received signal while canceling at least part of the contribution of the identified dominant interference source." This recitation is similar to the last recitation of Claim 1, and Applicants respectfully submit that the discussion above as to how Bergstrom fails to disclose or suggest the last clause of Claim 1 applies equally to the last clause of Claim 33. Accordingly, Applicants submit that the rejections of Claim 33, and the rejections of Claims 34-36 which depend therefrom, should be withdrawn for at least each of these reasons.

Claim 34 stands rejected based on the same rationale as Claims 3 and 33. Thus, for at least the reasons discussed above with respect to Claims 3 and 33, the rejection of Claim 34 should be withdrawn.

Claim 35 depends from Claim 33 and thus the rejection of Claim 35 should be withdrawn for each of the reasons the rejection of Claim 33 should be withdrawn. In addition, Claim 35 recites, among other things, "identifying as the dominant interference source the candidate interference source associated with an interference scenario . . . having the lowest classification measure." The Official Action cites to Col. 9, lines 1-16 of Bergstrom as disclosing this subject matter. However, the cited passage from Bergstrom does not discuss, among other things, dominant interference sources, interference scenarios and/or making an identification based on the interference scenario having the lowest classification measure. Thus, for at least each of these additional reasons, the rejection of Claim 35 should be withdrawn.

VI. Conclusion

Applicants submit that the present application is in condition for allowance and the same is earnestly solicited. Should the Examiner have any matters

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outstanding of resolution, he is encouraged to telephone the undersigned at 919-854-1400 for expeditious handling.

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